



RUTGERS
Geology Museum

Intro to Geologic Cores

Dr. Lauren Neitzke Adamo



Photo by Missy Holzer (PolarTREC 2008), Courtesy of ARCUS



Introduction to Cores

A core sample is a cylindrical section of (usually) a naturally occurring substance. Most core samples are obtained by drilling with special drills into the substance, for example sediment or rock, with a hollow steel tube called a core drill.

-Wikipedia





Tree Ring Cores

Photos Courtesy of ARCUS



Photo by Mark Paricio
(PolarTREC 2012)



Photo by Amanda Ruland
(PolarTREC 2019)



Photo by Allyson Woodard
(PolarTREC 2018)



Sediment and Rock Cores



Photos courtesy of Lauren Neitzke Adamo

Photo by Monica Nuñez
(PolarTREC 2019)
Courtesy of ARCUS



Ice Cores

Photos Courtesy of Arcus

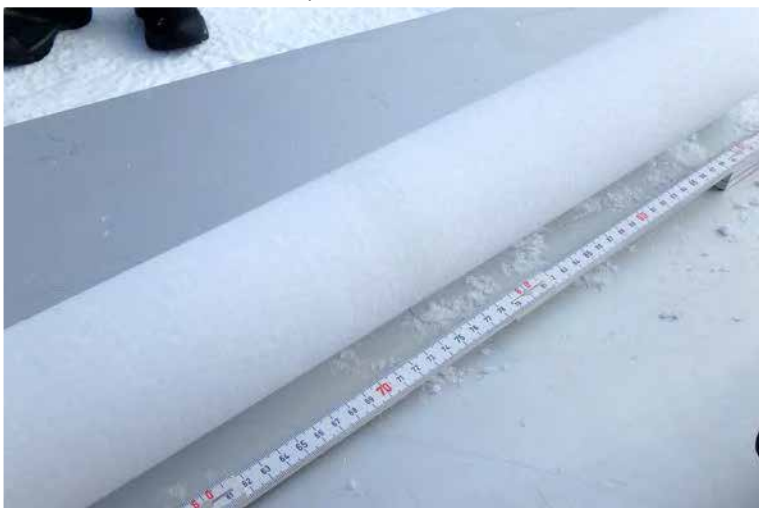


Photo by Steve Kirsche
(PolarTREC 2017)



Photo by Bill Schmoker
(PolarTREC 2015)



Photo by Cheri Hamilton
(PolarTREC 2009)



Ice Cores



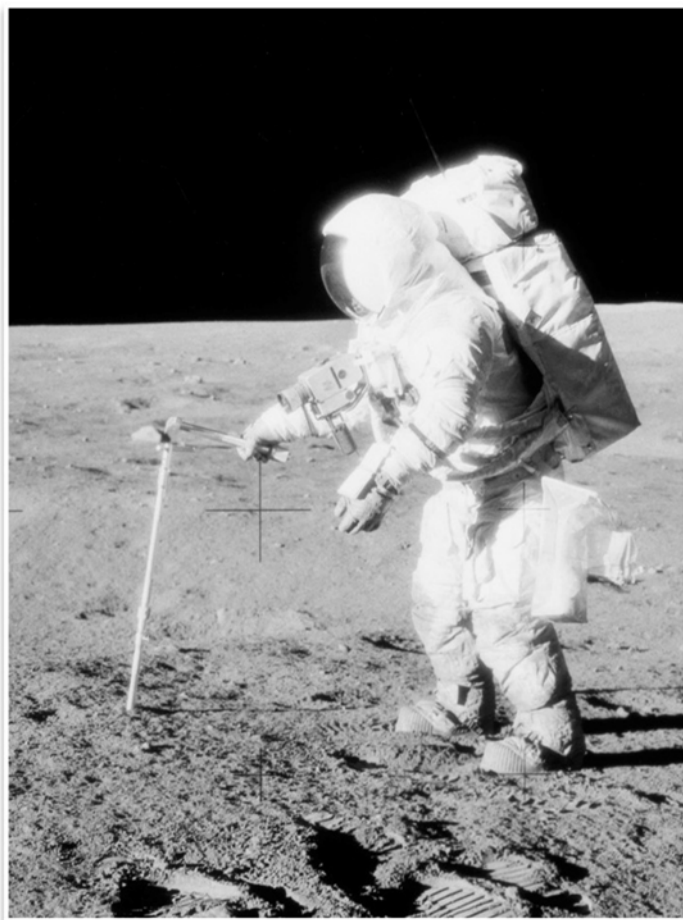


Ice Cores





Cores from the Moon!



**Collecting
Apollo 17
73002 on
lunar surface**

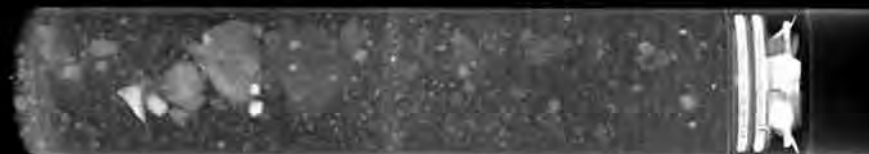


Cores from the Moon!



Above

X-Ray Computed Microtomography scan of sample 73002 taken 2019.
Credit: Dave Edey and Romy Hanna. UTCT, Jackson School of Geosciences, UT Austin



Below

X-Ray scan of sample 73002 taken 1974.
Credit: NASA.

Images from NASA



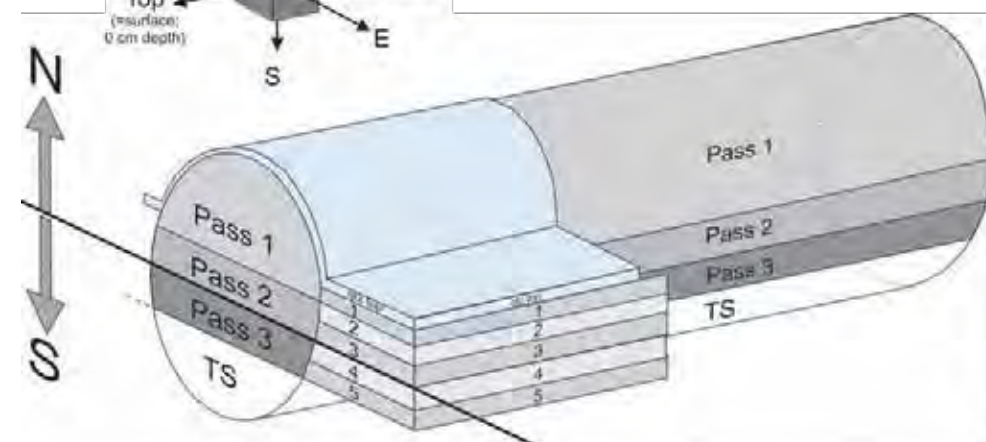
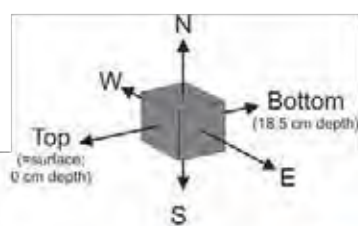
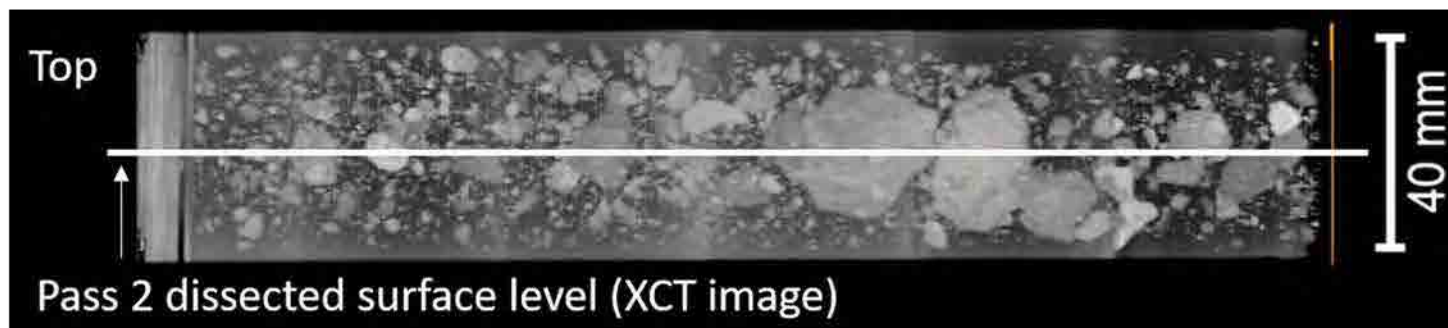
Cores from the Moon!



Apollo core team: Andrea Mosie, Charis Krysher, and Juliane Gross



Cores from the Moon!



Images from NASA



Life Cores

Life Core Activity



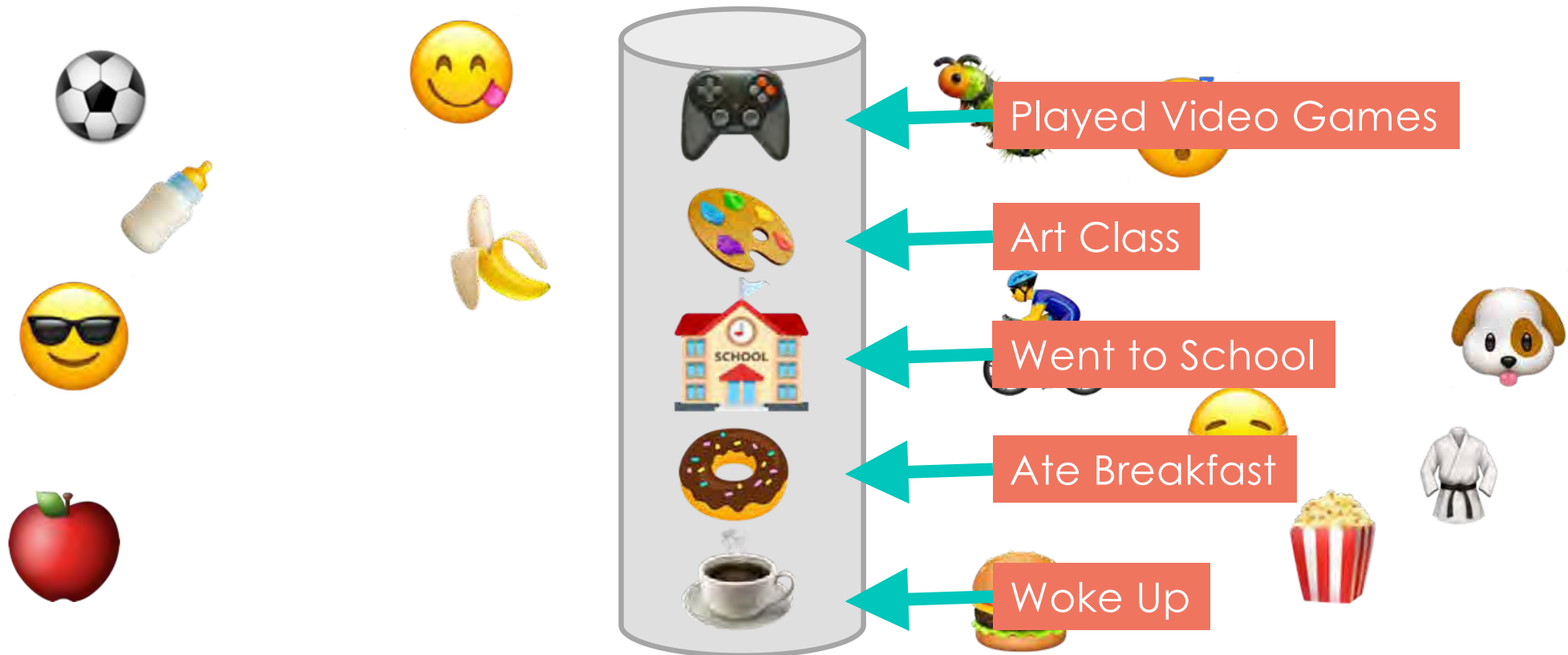


Life Cores- Emoji Cores



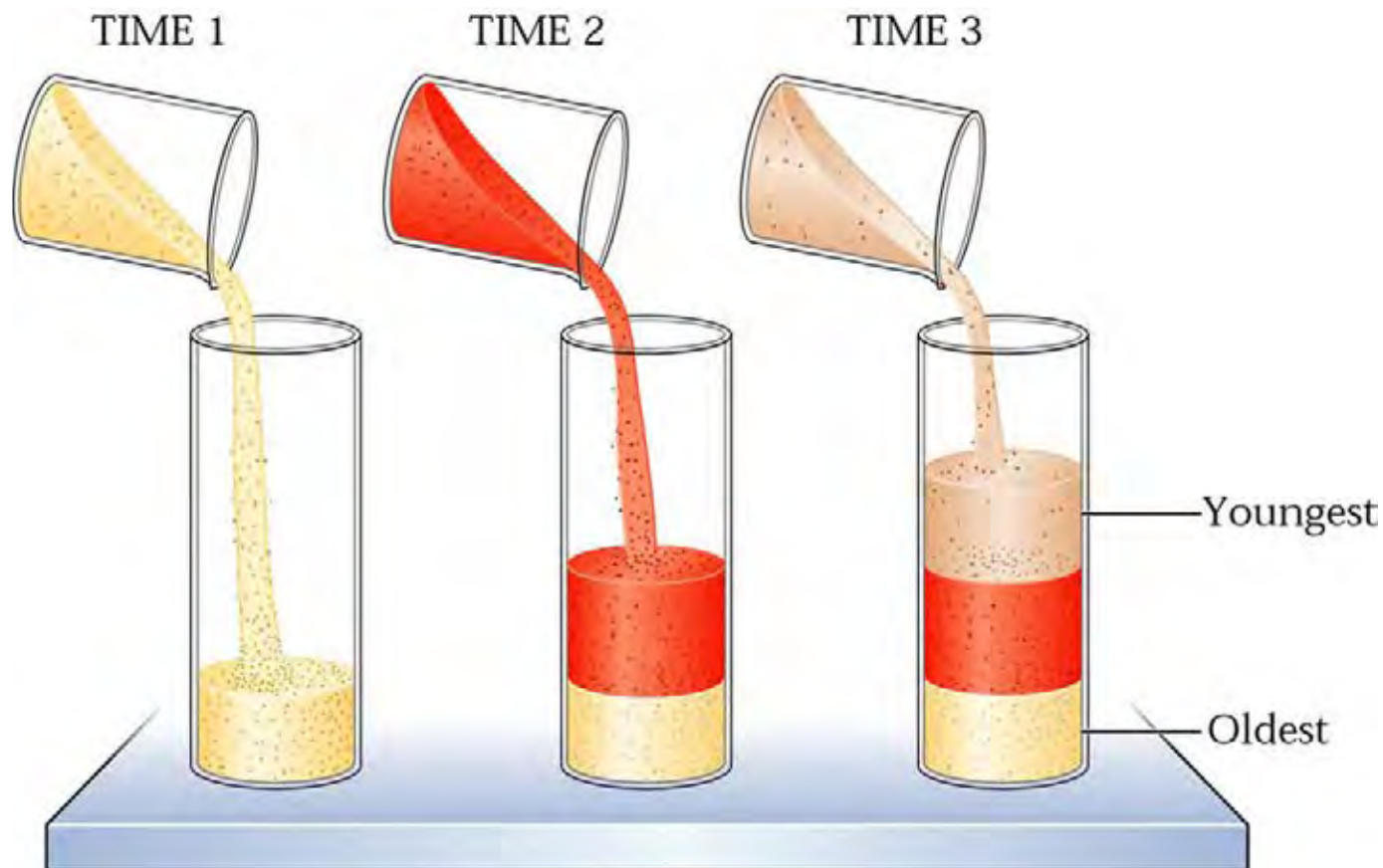


Life Cores- Emoji Cores



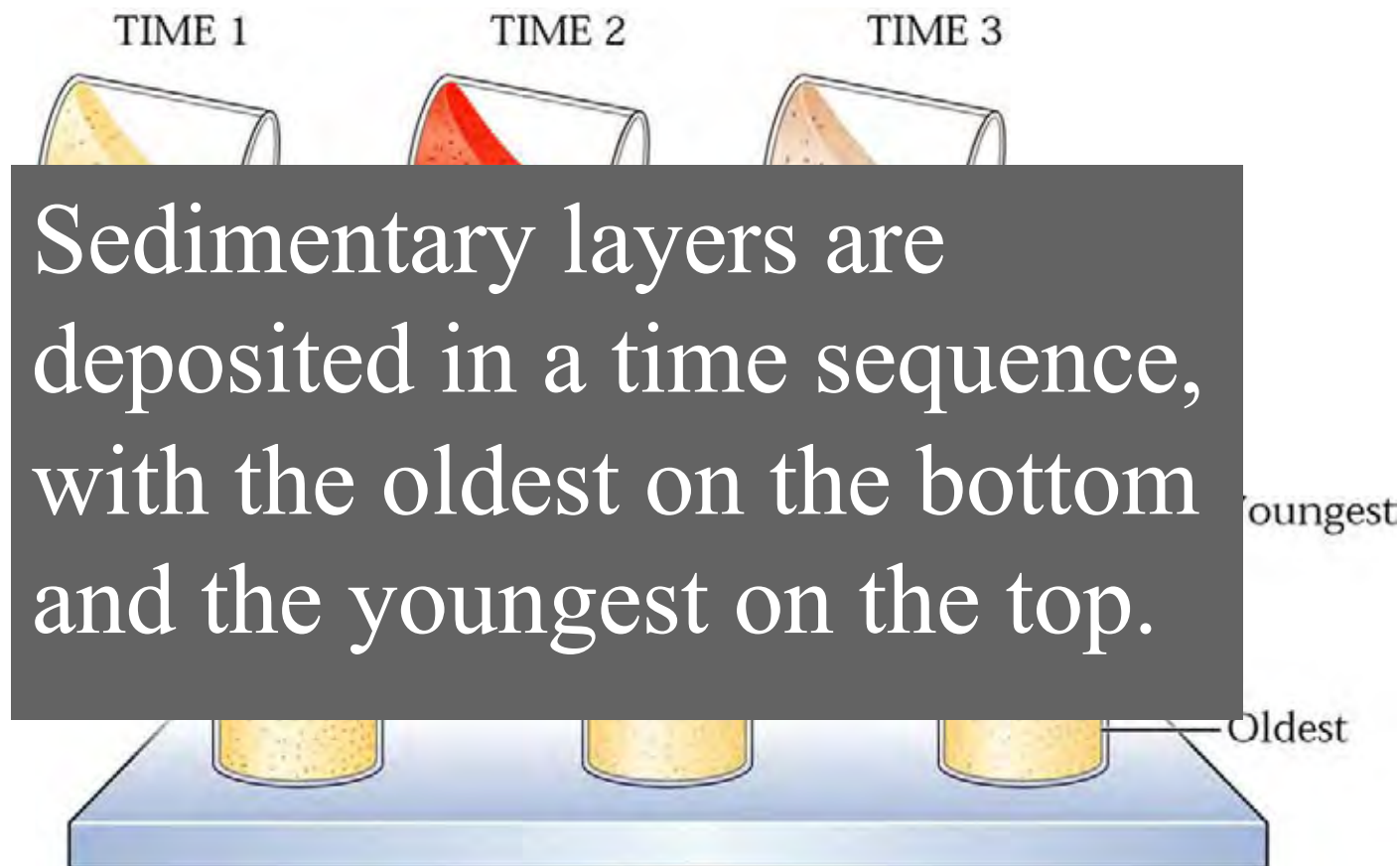


Principles of Stratigraphy



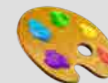
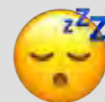


Principles of Stratigraphy





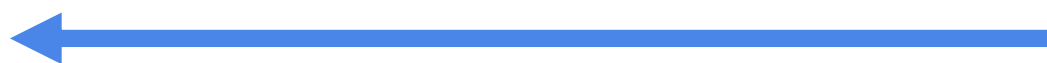
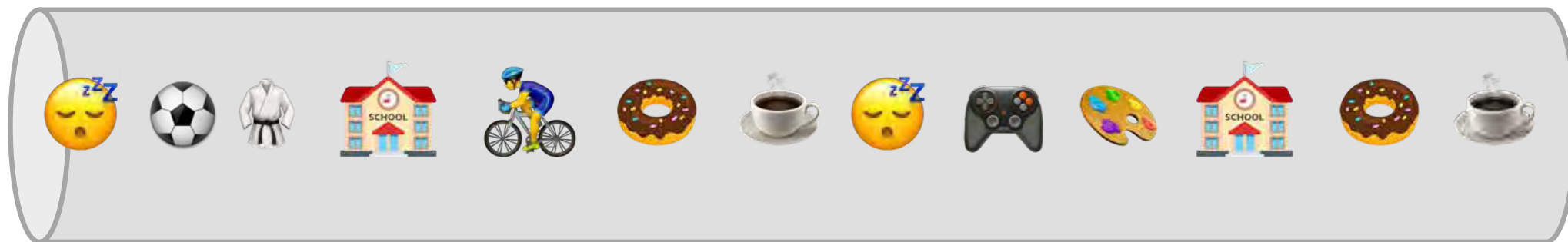
Life Cores- Emoji Cores



Day One



Life Cores- Emoji Cores



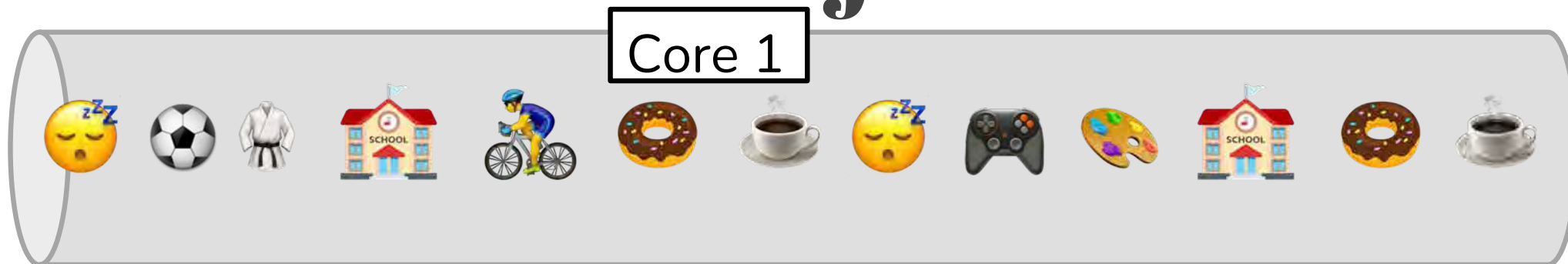
Day Two



Day One



Life Cores- Emoji Cores



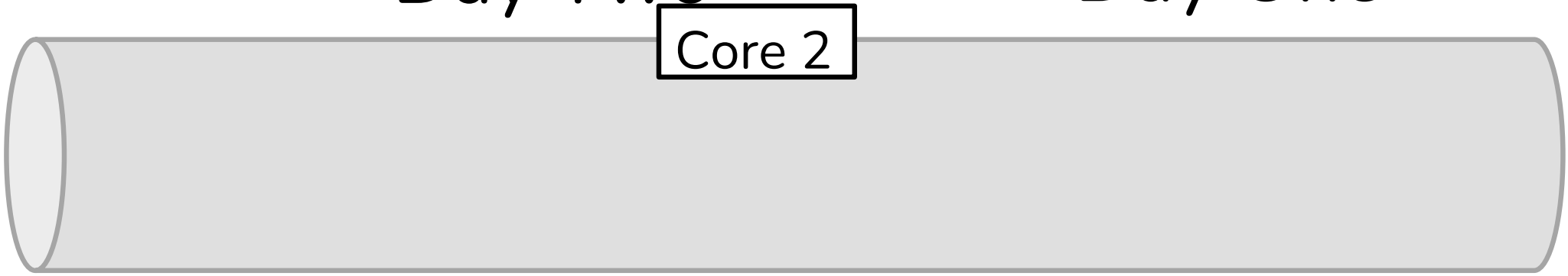
Core 1



Day Two



Day One

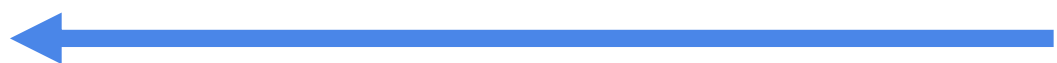
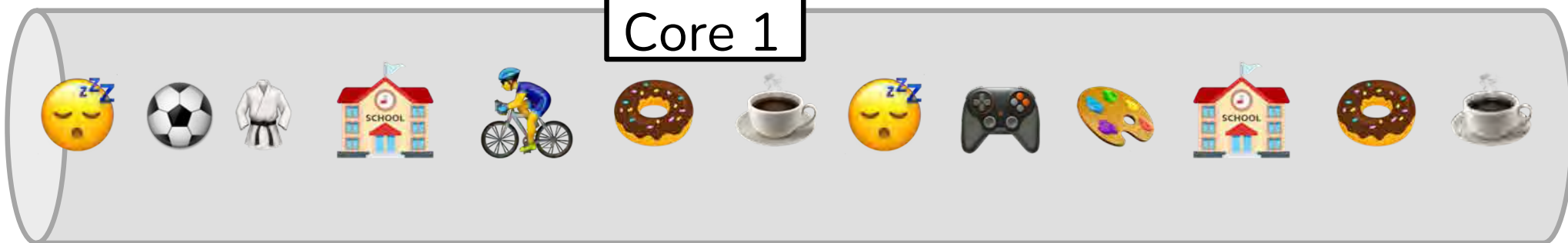


Core 2



Life Cores- Emoji Cores

Core 1

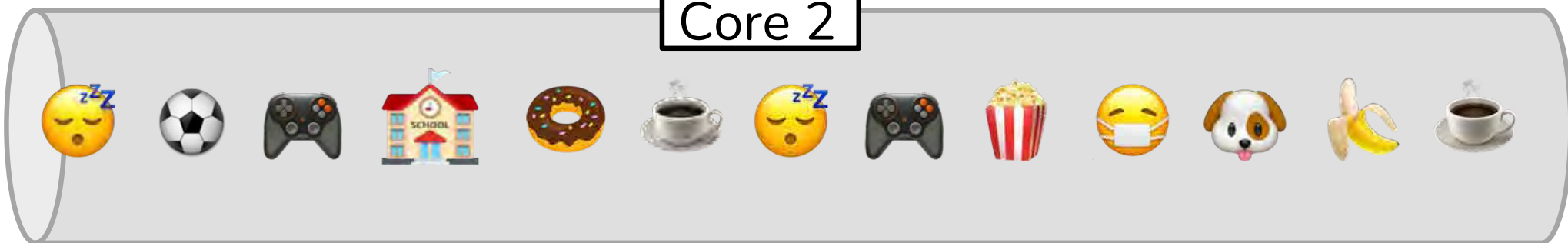


Day Two



Day One

Core 2



Day Two

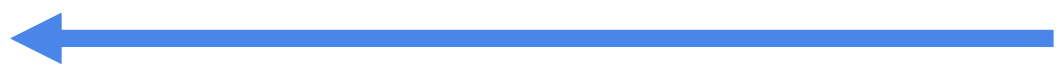


Day One



Life Cores- Emoji Cores

Core 1

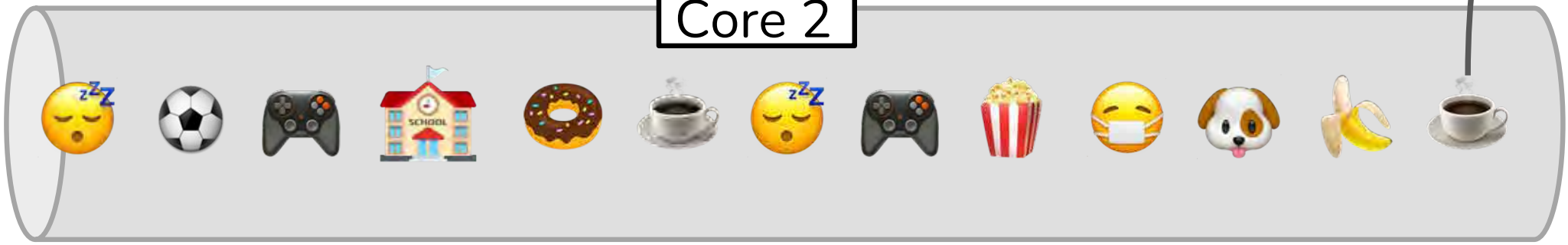


Day Two



Day One

Core 2



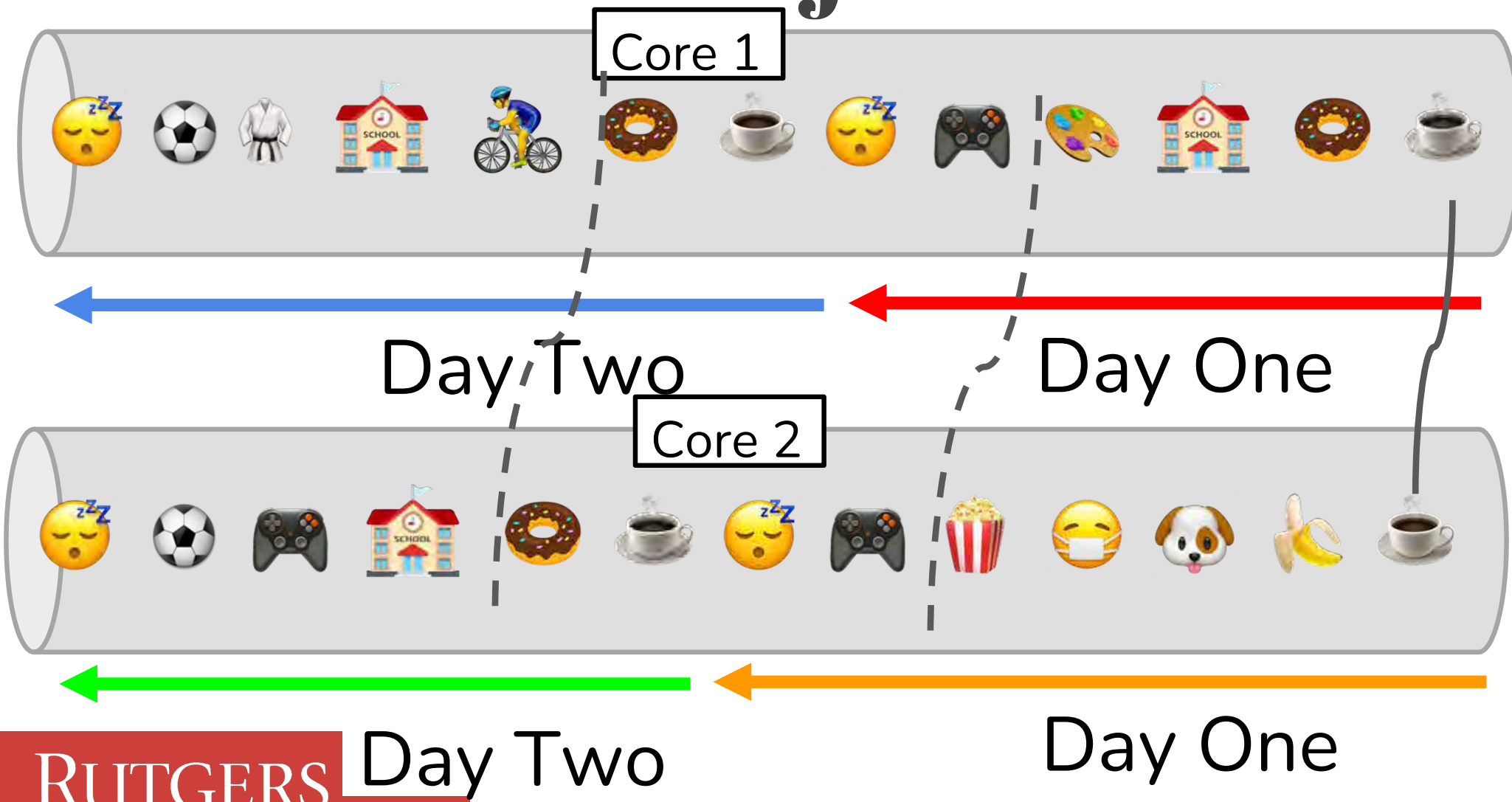
Day Two



Day One

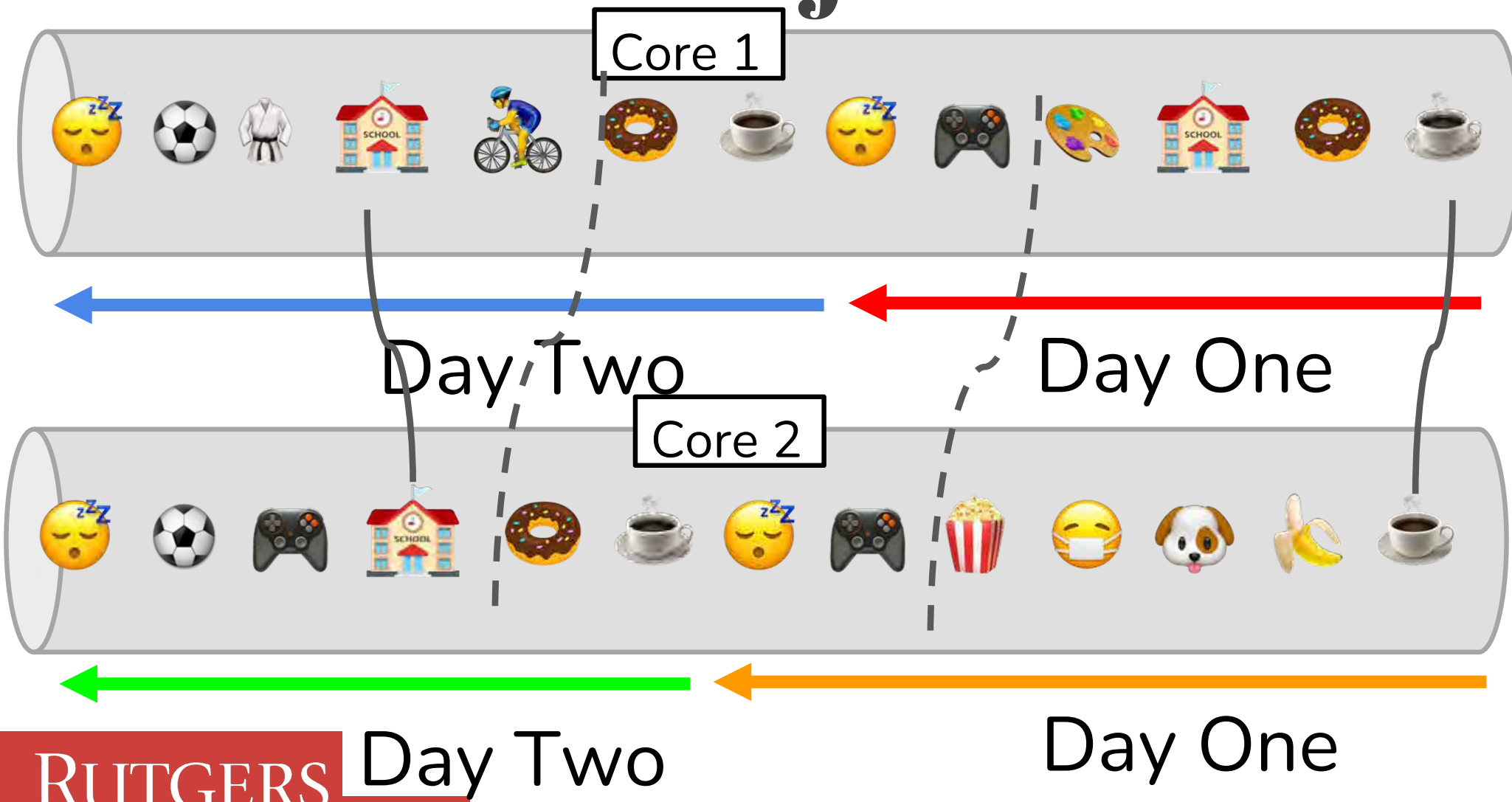


Life Cores- Emoji Cores



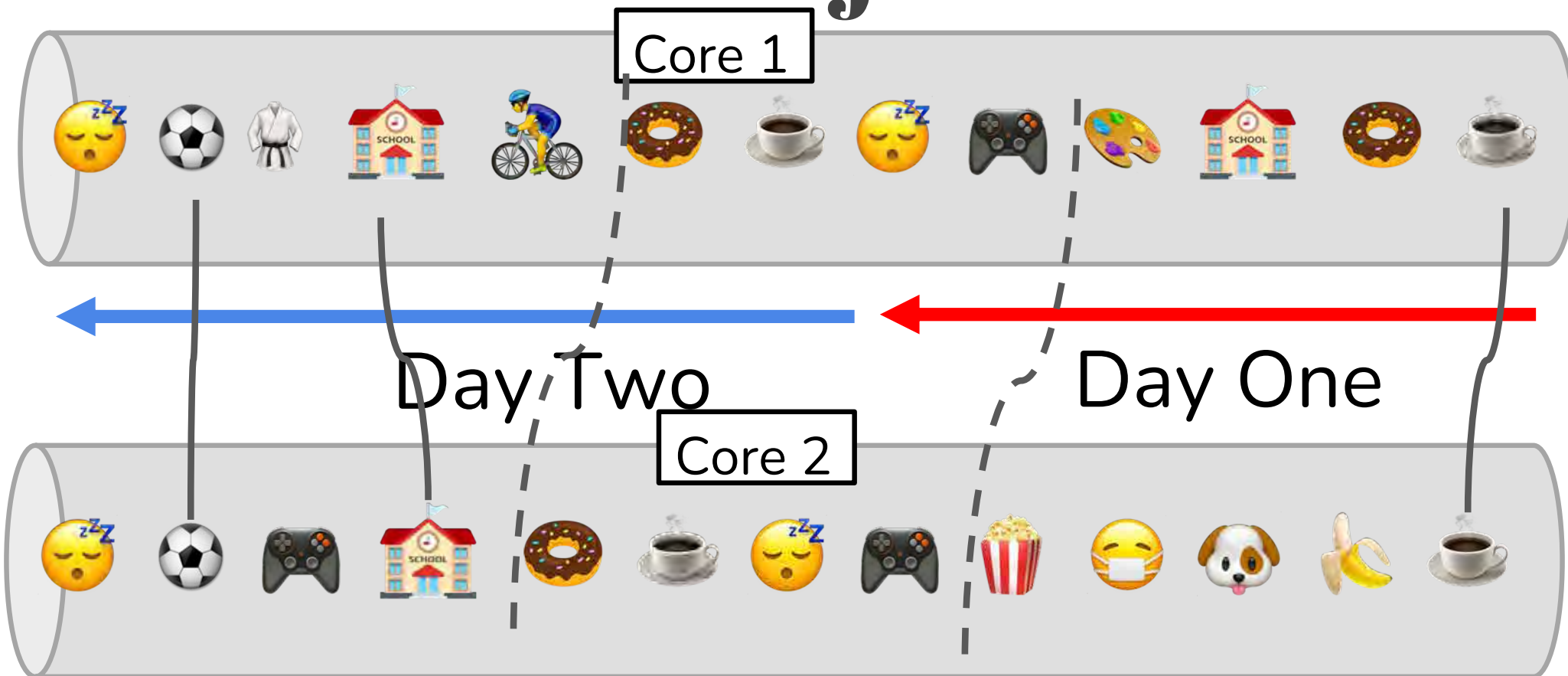


Life Cores- Emoji Cores



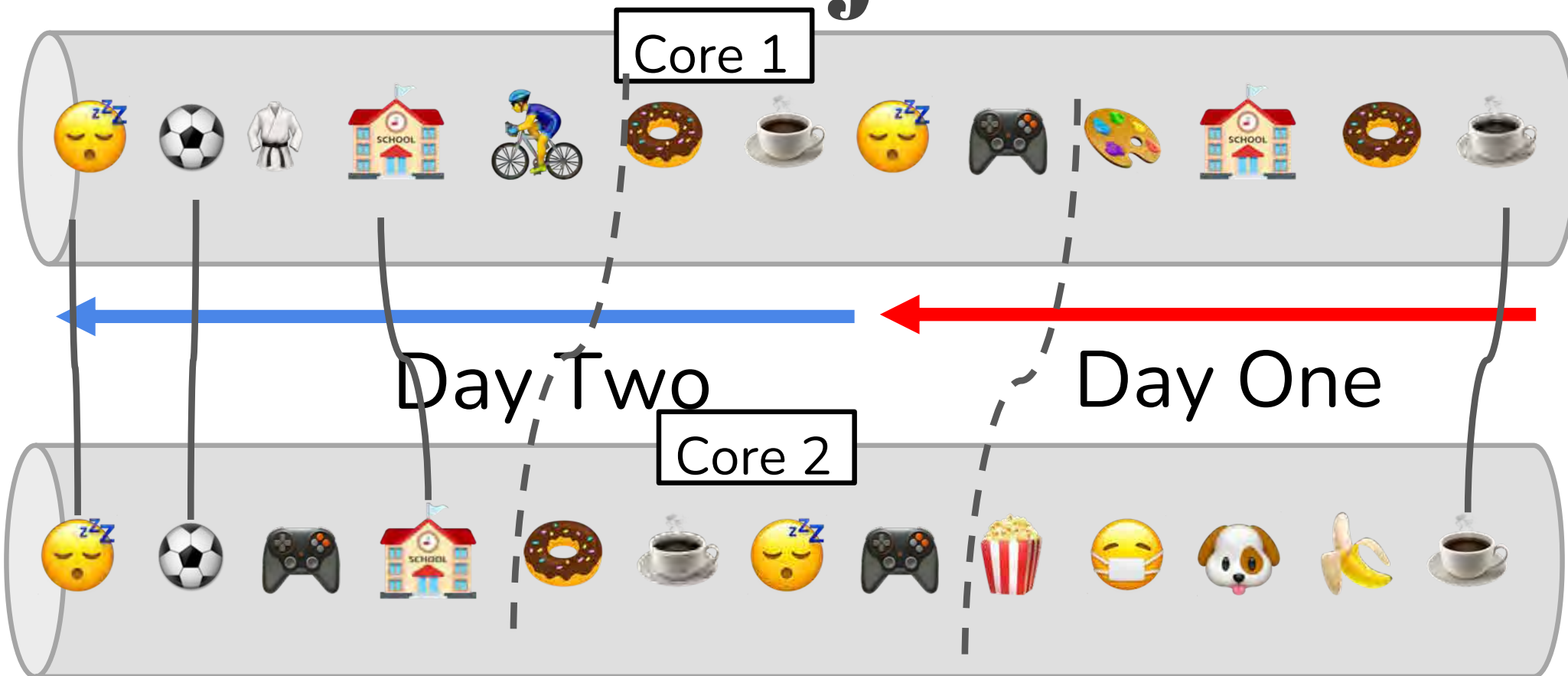


Life Cores- Emoji Cores



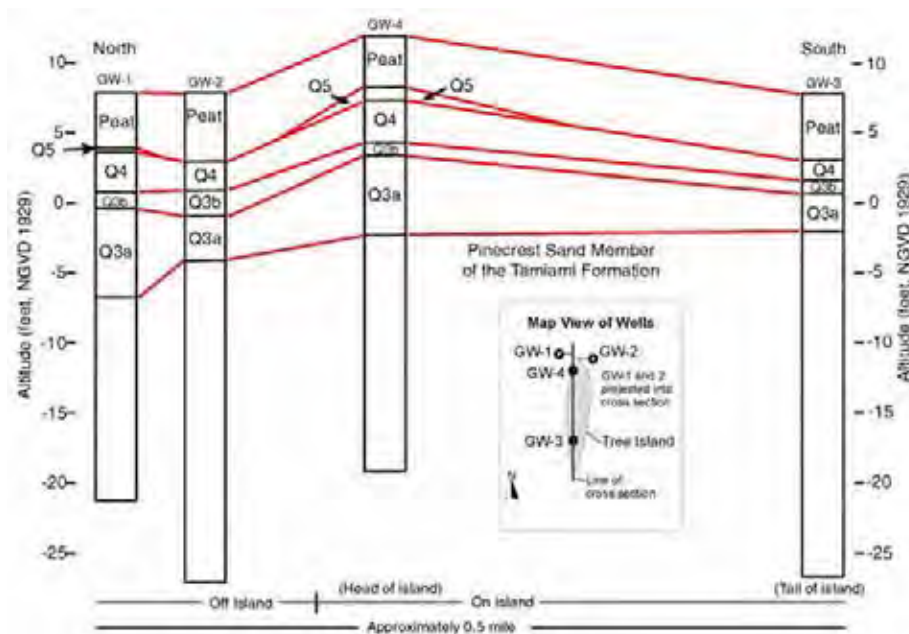


Life Cores- Emoji Cores

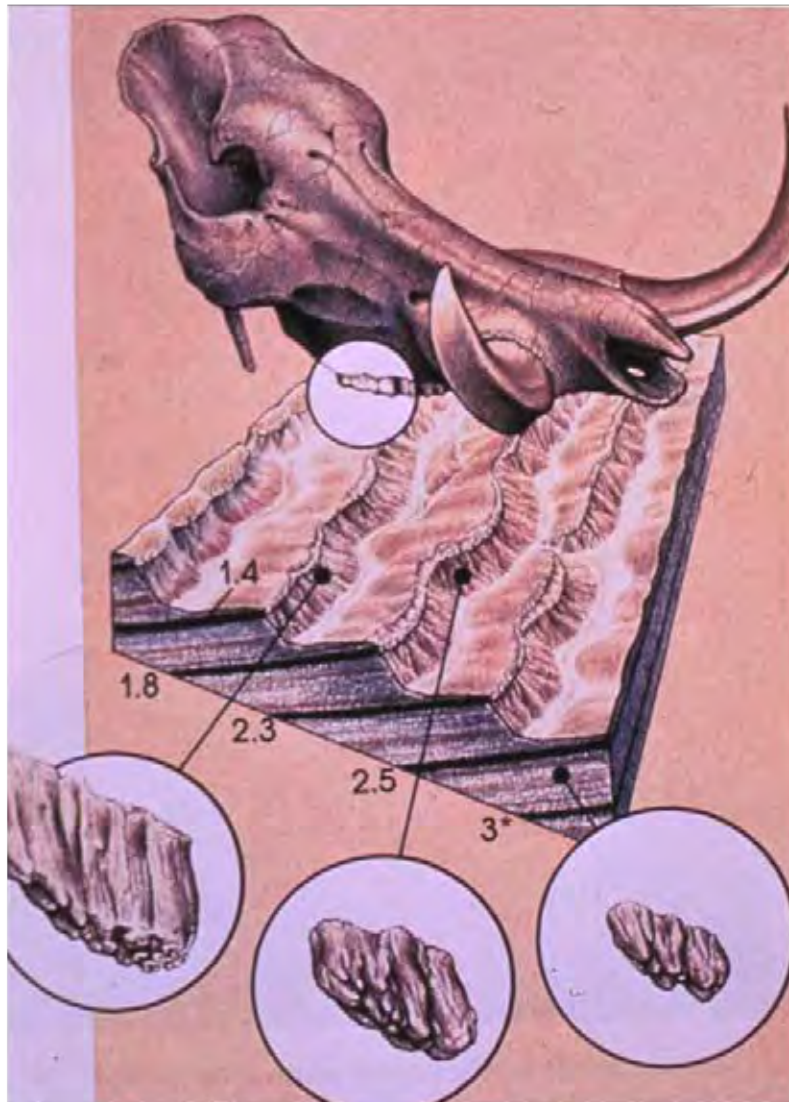




Correlation of Events



Steno's Principles of Stratigraphy



Faunal (Floral) Succession

Steno's Principles of Stratigraphy




The principle of faunal succession is based on the observation that sedimentary rock strata contain fossilized flora and fauna, and that these fossils succeed each other vertically in a specific, reliable order that can be identified over wide horizontal distances.



Faunal (Floral) Succession



Based on First and Last Appearances of Fossils and Trace Fossils

- First Appearance- When something evolved
 - Last Appearance- When something went extinct
 - Index Fossil- Organism that lives for a brief period of time
- 

What are fossils??

- Remnants or traces of ancient living organisms.
- Once living organisms preserved in rock.
- Form when organisms become buried with sediment.
- Include bones, teeth, footprints, burrows, etc...

Why do we care?

- Paleontology- the study of fossils
- Why do paleontologists study fossils?
- What can fossils tell us about the past?
 - They tell us two main things.



What do these fossils tell us?



What do these fossils tell us?



Paleoenvironment and Paleoecology

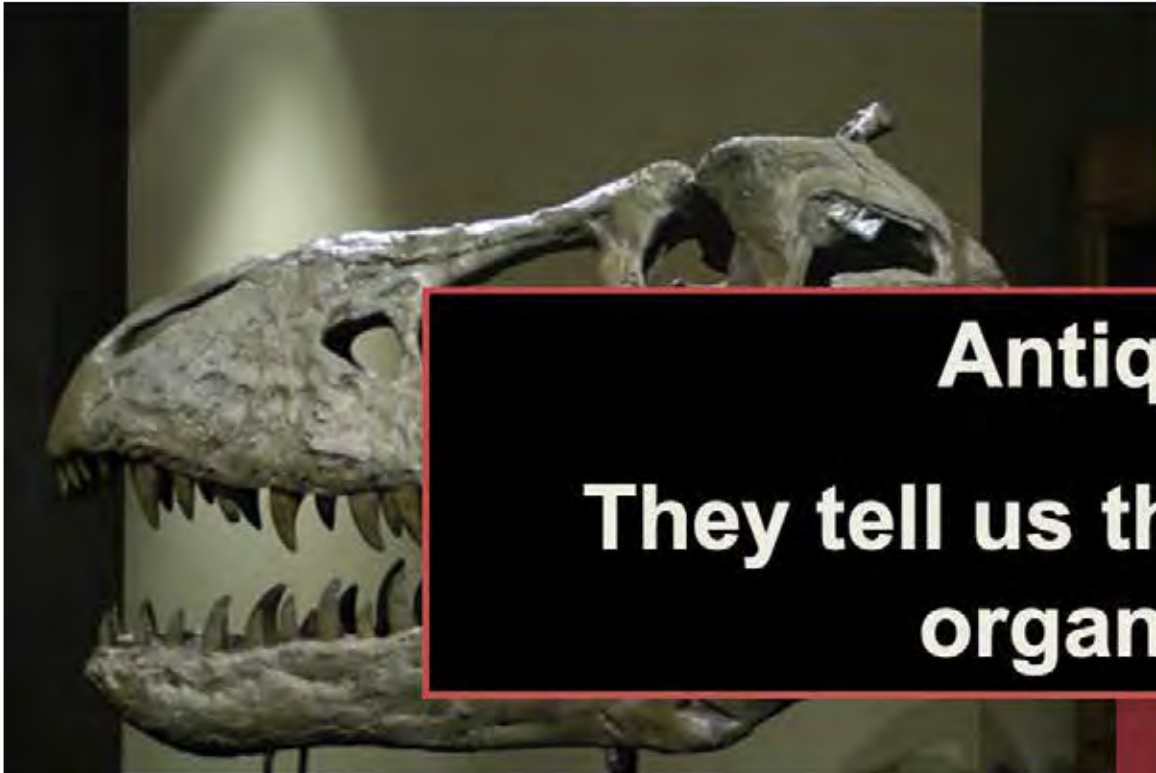
**They tell us the Environment
the organism lived in.**



What do these fossils tell us?



What do these fossils tell us?



Antiquity
They tell us the age of the organism.






















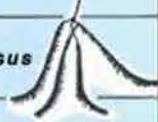




Index Fossils

- Fossilized species used to date/correlate strata.
 1. wide distribution
 2. alive for only a short time span
 3. distinguishing feature(s)

Good Index Fossils

- Trilobites
- Brachiopods
- Forams

| | | | | | |
|--|----------------------|------------------------------------|---|-----------------------------------|---|
| CENOZOIC ERA (Age of Recent Life) | Quaternary Period | <i>Pecten gibbus</i> |  | <i>Neptunea tabulata</i> |  |
| | Tertiary Period | <i>Calyptraphorus velatus</i> |  | <i>Venericardia planicosta</i> |  |
| MESOZOIC ERA (Age of Medieval Life) | Cretaceous Period | <i>Scaphites hippocrepis</i> |  | <i>Inoceramus labiatus</i> |  |
| | Jurassic Period | <i>Perisphinctes tiziani</i> |  | <i>Nerinea trinodosa</i> |  |
| | Triassic Period | <i>Trochites subbullatus</i> |  | <i>Monotis subcircularis</i> |  |
| | Permian Period | <i>Leptodus americanus</i> |  | <i>Parafusulina bosei</i> |  |
| PALEOZOIC ERA (Age of Ancient Life) | Pennsylvanian Period | <i>Dictyoclostus americanus</i> |  | <i>Lophophyllidium proliferum</i> |  |
| | Mississippian Period | <i>Cactocrinus multibrachiatus</i> |  | <i>Protecanites gurleyi</i> |  |
| | Devonian Period | <i>Mucrospirifer mucronatus</i> |  | <i>Palmatolepus unicornis</i> |  |
| | Silurian Period | <i>Cystiphyllum niagarense</i> |  | <i>Hexamoceras hertzeri</i> |  |
| | Ordovician Period | <i>Bathyrurus extans</i> |  | <i>Tetragraptus fructicosus</i> |  |
| | Cambrian Period | <i>Paradoxides pinus</i> |  | <i>Billingsella corrugata</i> |  |
| PRECAMBRIAN | | | | | |



Bad Index Fossils??



Bad Index Fossils??

Horseshoe Crabs- Evolved in Paleozoic (540-248 million years ago)

